

Prevalence and Distribution of Oral Soft Tissue Diseases in Stunting Children Aged 12-59 Months at Sukorambi Community Health Center

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ABSTRACT

Introduction: Stunting as a failure in children's growth due to chronic nutrition with short height tends to have a high prevalence (21,6%) in Indonesia. Nutritional disorders in stunting children cause the body's immune system to weaken so that children are susceptible get infections, including oral soft tissue diseases.

Aim: To determine and assess the prevalence and distribution of oral soft tissue diseases in stunting children aged 12 – 59 months at the Sukorambi Community Health Center.

Methods: This research is a descriptive observational with a cross sectional design on a population of 200 stunting children in the Sukorambi Community Health Center Working Area. Purposive sampling was used to determine the sample size so that 70 samples were obtained according to the criteria.

Results: Prevalence and distribution of oral soft tissue diseases among respondents was 32,5% with the most cases being women (50,98%) and the age group 24-35 months (27,14%). The type of oral tissue disease with highest prevalence were oral ulcer (10,50%), suspect oral candidiasis of the tongue (9,50%), glossitis (4,00%), cheilitis (3,50%), geographic tongue (2,50%), angular cheilitis (1,50%), and other lesions (1,00%).

Conclusion: Oral ulcer was the type of oral soft tissue disease with the highest prevalence in stunting children and occurred most often in women (52,38%) also the age group 36-47 months (47,62%). Thus, special attention is needed by the relevant health instance to maintain the oral health of stunting children because this can affect their nutritional intake.

Keywords: stunting, oral soft tissue disease, prevalence, distribution, nutrition.

INTRODUCTION

Stunting has become a global issue due to its serious impacts. The prevalence of stunting in Indonesia remains above the World Health Organization (WHO) standard threshold of 20%. Jember Regency, located in East Java Province, contributes to a high prevalence of stunting, reported at 34.9%.¹ According to data from the Jember Health Office in 2023, Sukorambi Public Health Center has the highest prevalence of stunting in the Jember area after Mangli Public Health Center (18.97%) and Rambipudji Public Health Center (18.66%).

Stunting has resulted in one million children losing their lives each year and is a risk factor for child mortality.² Stunting is defined as a growth failure experienced by children due to chronic nutritional problems, characterized by short stature.³ The long-term effects of

stunting in infancy and early childhood include decreased cognition and school performance, hindered physical development, poor health, and loss of independence.⁴

Nutrient deficiencies make stunted children vulnerable to lesions caused by metabolic imbalances and decreased immune resistance. This triggers dental and oral health issues such as dental caries and soft tissue diseases of the mouth, including atrophic glossitis, angular cheilitis, oral ulcers, and oral candidiasis.⁵ Soft tissue diseases of the mouth can be caused by deficiencies in macronutrients and micronutrients such as protein, iron, vitamin B, folic acid, and others.⁶ These nutrients play a crucial role in maintaining normal regeneration and proliferation of oral epithelial cells.

The three most prevalent soft tissue diseases of the mouth found in stunted children, based on two previous studies, are atrophic glossitis, angular cheilitis, and oral ulcers.^{5,6} These diseases have the potential to become clinical indicators of a child's stunting condition, necessitating special care to maintain the oral health of stunted children, as this can affect their food intake related to nutritional consumption.⁶ Data on the prevalence of soft tissue diseases of the mouth in stunted children is expected to help understand the health program burdens that need to be addressed and become a government focus in reducing stunting rates. The peak of abnormal growth failure in height or weight is evident when the child is 12 months old.⁷ At this age, children are more active and begin eating family food, which can influence their growth and development if the necessary nutrition is not met. At 24 to 59 months, children show rapid

growth and development according to the nutritional intake they receive during two periods, along in utero and after birth up to 24 months. If during these two periods the nutritional intake is inadequate, the child's physical growth will be disrupted.⁸ Physical conditions observed as a result of this include the child's height not reaching the average height for their age (stunting).

MATERIALS & METHODS

This is a descriptive observational study with a cross-sectional design. The research was conducted in the Working Area of the Sukorambi Community Health Center, Jember Regency, from September to October 2023. The population consists of 200 children with a sample size of 70 stunted children aged 12 to 59 months determined using Slovin's formula. The determination of stunting subjects was based on the monthly nutrition status data recap according to the Z-score by the Sukorambi Community Health Center. Purposive sampling technique was used to select samples according to criteria at several posyandu. Examination of soft tissue diseases of the mouth was conducted through inspection with the aid of a mouth mirror and headlamp. Subjects were instructed to open their mouths and stick out their tongues, which were then documented.

Descriptive analysis was used to calculate the percentage of soft tissue diseases of the mouths in stunted children aged 12 to 59 months. Univariate analysis was employed to describe the data analyzed in the form of a histogram depicting the frequency distribution of respondents and the prevalence of soft tissue diseases of the mouth. The formula for prevalence is as follows.⁹

$$\text{Prevalence} = \frac{\text{Number of disease cases at that time in the population}}{\text{Total number of people in the population}} \text{ over a period of time} \times 100\%$$

RESULT

Table 4.1 shows the research subjects consisting of 70 stunted children, with 35

children (50%) being female and 35 children (50%) being male. The age group of 36 – 47 months was the most frequently encountered

respondent, with 26 children (37.14%), of which 15 children (20.00%) were female and 12 children (17.14%) were male.

Table 1. Frequency distribution of stunted children aged 12 – 59 months in the Working Area of Sukorambi Health Center, Jember Regency.

Age (months)	n	Gender				
		Female		Male		Total
		n	%	n	%	
12 – 23	13	2	2,86	11	15,71	18,57
24 – 35	21	12	17,14	9	12,86	30,00
36 – 47	26	14	20,00	12	17,14	37,14
48 – 59	10	7	10,00	3	4,29	14,29
Total	70	35	50	35	50	100

Figure 1 shows that the most cases of children with stunting suffering from soft tissue diseases of the mouth occur at the age of 24–35 months with a total of 19 children (27.14%), followed by the age of 36–47 months with a total of 17 children (24.29%),

the age of 12–23 months with a total of 10 children (14.29%), and the least cases of soft tissue diseases of the mouth are at the age of 48–59 months with a total of 5 children (7.14%).

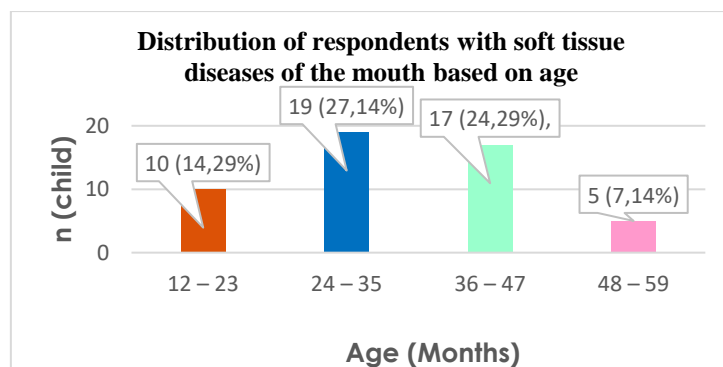


Figure 1. Histogram of the distribution of respondents with soft tissue diseases of the mouth based on age

Figure 2 shows that out of 70 respondents, 51 children (72.86%) suffer from soft tissue diseases of the mouth, consisting of 26 girls (50.98%) and 25 boys (48.02%). Based on

gender, female respondents have a higher number of abnormalities compared to male respondents.

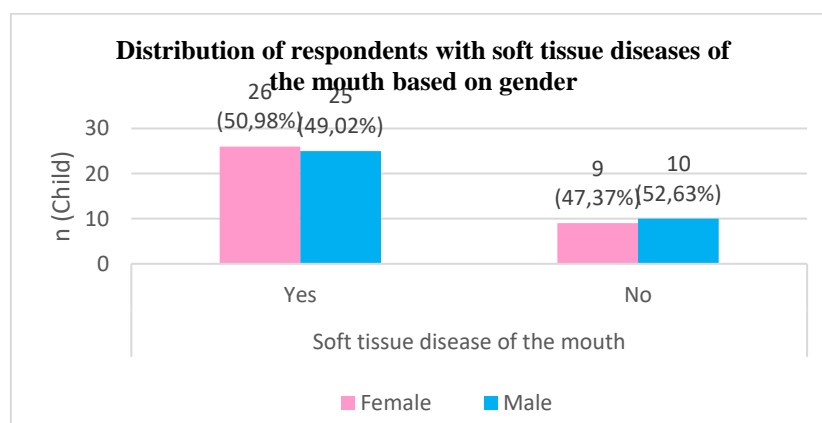


Figure 2. Histogram of the distribution of respondents with soft tissue diseases of the mouth based on gender

Figure 3 shows the number of soft tissue disease lesions of the mouth that occur in each respondent. Respondents with 1 type of lesion totaled 38 children (54.28%), with a higher number of females. Respondents with

2 types of lesions occurred in 12 children (17.14%), with an equal number of females and males, 6 children each. Respondents with 3 types of lesions occurred in 1 child (1.43%), with the child being male.

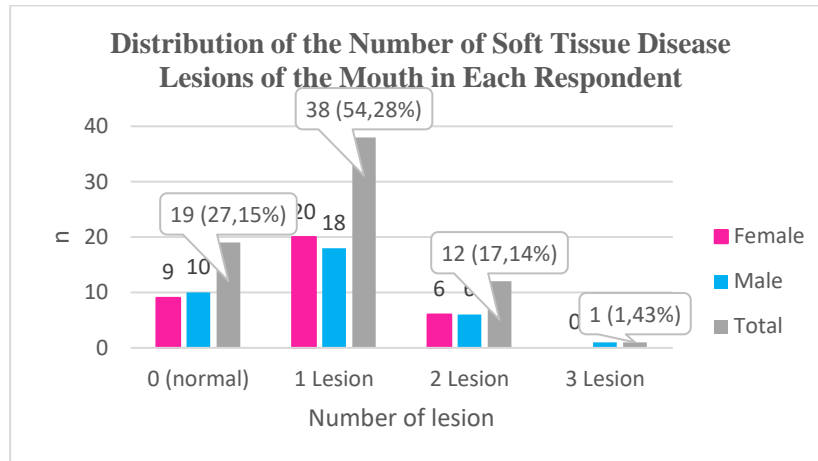


Figure 3. Histogram of the distribution of soft tissue diseases in the oral cavity among each respondent.

Table 2 shows that the prevalence of soft tissue diseases of the mouth in respondents is 32.5%. The types of soft tissue diseases of the mouth with the highest prevalence are as follows: oral ulcers in 21 children (10.50%), suspected oral candidiasis of the tongue in 19 children (9.50%), atrophic glossitis in 8

children (4.00%), cheilitis in 7 children (3.50%), geographic tongue in 5 children (2.50%), and angular cheilitis in 3 children (1.50%). Other lesions (gingival hyperpigmentation and hyperkeratosis) were found in 2 children (1.00%).

Table 2. Prevalence of soft tissue diseases of the mouth in stunted children aged 12–59 months in the Working Area of Sukorambi Health Center, Jember Regency

Oral Soft Tissue Diseases	Observation Result	
	n	Prevalence (%)
Atrophic glossitis	8	4,00
Angular cheilitis	3	1,50
Oral ulcer	21	10,50
Cheilitis	7	3,50
Suspect oral candidiasis of tongue	19	9,50
Geographic tongue	5	2,50
Other lesion*	2	1,00
Total	65	32,5

(*): Other lesion as a hyperpigmentation gingiva and hyperkeratosis

Table 3 shows the distribution of soft tissue diseases of the mouth according to age as follows: 1) glossitis: most common in the age group of 25–35 months (5 children); 2) angular cheilitis: all age categories have the same number of respondents, namely 1 child, except for the age group of 25–35 months, which has 0 children; 3) oral ulcer: most common in the age group of 36–47 months

(10 children); 4) cheilitis: most common in the age group of 36–47 months (4 children); 5) suspected oral candidiasis of the tongue: the age groups of 12–24 months and 36–47 months have the highest number of respondents, each with 7 children; 6) geographic tongue: most common in the age groups of 12–24 months and 48–59 months, each with 2 children; 7) other lesions: found

in the age group of 36–47 months (2 children).

Table 3. Distribution of soft tissue diseases of the mouth according to age in stunted children aged 12–59 months at the Sukorambi Health Center, Jember Regency

No	Oral Soft Tissue Diseases	Age (months)			
		12 – 23	24 – 35	36 – 47	48 – 59
1	Glossitis	1	5	1	1
2	Angular cheilitis	1	0	1	1
3	Oral ulcer	2	6	10	3
4	Cheilitis	0	2	4	1
5	Suspect oral candidiasis of tongue	7	7	4	1
6	Geographic tongue	2	1	2	0
7	Other lesion*	0	2	0	0

(*): Other lesion as a hyperpigmentation gingiva and hyperkeratosis

Table 4 shows the distribution of types of soft tissue diseases of the mouth according to gender. The most frequently encountered diseases in females are glossitis (62.50%), angular cheilitis (66.66%), and oral ulcers (52.38%). Meanwhile, the most frequently

encountered diseases in males are cheilitis (57.14%), suspected oral candidiasis of the tongue (52.38%), and geographic tongue (80%). Other lesions were found in 1 female child and 1 male child each.

Table 4. Distribution of soft tissue diseases of the mouth according to age in stunted children aged 12–59 months at the Sukorambi Health Center, Jember Regency

No	Oral Soft Tissue Diseases	Gender				
		Female		Male		Total
		n	%	n	%	
1	Glossitis	5	62,50	3	37,50	100
2	Angular cheilitis	2	66,66	1	33,33	100
3	Oral ulcer	11	52,38	10	47,62	100
4	Cheilitis	3	42,86	4	57,14	100
5	Suspect oral candidiasis of tongue	9	47,37	10	52,63	100
6	Geographic tongue	1	20,00	4	80,00	100
7	Other lesion*	1	50,00	1	50,00	100

(*): Other lesion as a hyperpigmentation gingiva and hyperkeratosis

Table 5 shows the types of occupations of 70 parents of respondents based on the age classification of stunted children (12-59 months). Laborers and workers are the most common occupations among the parents of respondents (28 individuals), with the

highest number found in the age group of 36–47 months. Casual laborers and farmers each account for 9 and 8 parents, respectively. The least common occupation is civil servants, totaling 3 parents.

Table 5. Distribution of the types of occupations of parents of stunted children aged 12–59 months in the Working Area of Sukorambi Health Center, Jember Regency

Type of Occupation	Months				Total
	12 – 24	24 – 35	36 – 47	48 – 59	
Laborers and workers	4	9	12	3	28
Odd jobs	1	2	4	2	9
Farmers	3	1	2	2	8
Enterpreneurs	5	5	5	3	18
Civil servants	0	0	3	0	3
etc*	0	2	0	2	4
Total	13	19	26	12	70

(*): Security guard, driver, and unknown.

DISCUSSION

The characteristics and distribution of respondents are presented in Table 1, which shows that respondents aged 36–47 months had the highest number, namely 26 children (37.14%). These results are in line with Amanda's (2023) study, which found that stunted children aged 3 years are much more common than other ages.¹⁰ Additionally, a stunting study in Kalisat stated that the ages 2–3 years are the most common ages for toddlers to experience stunting.¹¹ Meanwhile, the age group 24–35 months, with 21 respondents (30.00%), is the second most frequent age group after the 36–47 months group. The 12–23 months age group had 13 stunted children (18.57%). In the age range of 12–36 months, children's food intake still depends on parental provision (passive consumers).¹²

Lack of food intake in children occurs due to the low economic status of parents, making children at risk of experiencing stunting.⁷ According to the results of interviews with the respondents' mothers (Table 5), out of 70 respondents, the majority of the respondents' fathers' occupations were laborers (28 people), farmers (8 people), and low-income odd-job workers (9 people). Low income affects the availability and variety of food, so with minimal funds, a family cannot afford to buy a variety of foods.⁷ This can indirectly affect the nutritional status of the children in that family.

Based on gender (Table 1), there were an equal number of female and male respondents, each with 35 children (50%). This is consistent with previous research by Rahayu et al. (2020), which found no correlation between gender and the occurrence of stunting.⁷ The possible reason is that the growth rate in both female and male toddlers is still the same.

The distribution of soft tissue diseases of the mouth by age in stunted children is presented in Figure 1, which shows that the highest occurrence of soft tissue diseases in the mouth among stunted children is in the age range of 12–35 months, with 29 children,

compared to the age range of 36–59 months, with 22 children. Between the ages of 12–36 months, a child undergoes rapid growth and development.¹³ This increases the child's nutritional needs, so if these needs are not met, it can result in malnutrition and make the body more susceptible to lesions.

The distribution of soft tissue diseases of the mouth by gender, according to Figure 2, shows that 51 children (72.86%) had lesions, with females being the most affected, accounting for 26 children (50.98%). Research indicates that stunted children tend to have soft tissue diseases of the mouth. Hasbullah's (2021) study on stunted children in Panduman Village states that the occurrence of soft tissue diseases of the mouth in stunted children is related to inadequate intake of zinc, vitamin B12, and iron.⁵ Based on gender, stunted female children have more lesions than males. Female children tend to experience lower nutritional status due to cultural factors that prioritize male children in food allocation, leading to not optimal nutritional intake for female children.⁷

The distribution of the number of soft tissue disease lesions in each respondent, according to Figure 3, shows that stunted children with one type of lesion (54.28%) in their oral cavity are more frequently found than stunted children with more than two types of lesions. This finding aligns with Hasbullah's (2021) study, where one type of soft tissue disease lesion was most commonly found in stunted children aged 24–60 months, with 30 children (50.85%).⁵ The occurrence of lesions is influenced by malnutrition in stunted children. Nutritional deficiencies lower the child's immunity, making them more susceptible to infections. Nutritional deficiencies in children negatively impact the quantity and quality of saliva, leading to changes in the integrity of the soft tissues of the oral cavity.¹⁴

Research data (Table 2) shows that the prevalence of soft tissue diseases of the mouth in the at-risk population is 32.5%. The type of soft tissue disease with the highest

prevalence is oral ulcers, at 10.50% (21 children). The prevalence of recurrent aphthous stomatitis (RAS) is the most frequent lesion, occurring in 5% to 25% of the total population encountered.¹⁵ Based on age (Table 3), the age group 36–47 months has the highest number of oral ulcer cases. This is supported by data indicating that laborers and workers are the most common occupations among the parents of respondents aged 36–47 months (Table 5). This influences how a family can provide a variety of foods as sources of nutrition for the child.⁷ Besides nutritional deficiencies, the high prevalence of oral ulcers in this study is also due to the influence of the child's age. Children aged 12–59 months are in an active phase, making them more prone to trauma, which causes injuries to the soft tissues of the mouth and triggers traumatic ulcers. The wounds caused by trauma result in inflammation, requiring a complex process for healing.¹⁶

The prevalence of glossitis in this study is 4.00% (8 children). Cases of glossitis are more frequently found in the age group of 24–35 months (Table 4.3) and among females, with a percentage of 62.50% (5 children). Hasbullah's (2021) research also reported that atrophic glossitis was the most common lesion found in stunted children categorized as very short in the age group of 24–35 months (66.67%).⁵ Micronutrient deficiencies in stunted children, such as iron, folic acid, niacin, vitamin B2, and vitamin B12, often lead to this lesion. In such conditions, the epithelial cells in the oral cavity regenerate more rapidly, resulting in immature and atrophic mucosa.¹⁷ Glossitis refers to the inflammation of the tongue due to depapillation, causing a burning sensation and pain in the dorsum of the tongue.¹⁸ The prevalence of glossitis can vary worldwide, with differences influenced by gender, age, race, as well as the diagnostic procedures and methods used in studies.⁵ When diagnosing glossitis, it is crucial to verify whether the lesions change within 12–24 hours after the initial observation to rule out the hypothesis of geographic tongue.¹⁹

In this study, there were 3 cases of angular cheilitis (1.50%). Table 3 shows that each of the 3 cases of angular cheilitis involved one respondent in the age groups of 12–23 months, 36–47 months, and 48–59 months. A prevalence of 3% for angular cheilitis was found in the study by Vieira et al. (2013), conducted on preschool children with low socioeconomic conditions.²⁰ The prevalence of angular cheilitis has also been reported in Argentina (3.54%), Spain (3.79%), and Brazil (3%).^{20,21} In contrast, the study by Maula et al. (2022) found that angular cheilitis was the most common lesion among stunted toddlers, with a prevalence of 42.5%.⁶ Differences in study results may be attributed to the varied etiology of angular cheilitis, which can include local trauma, irritant reactions, infectious agents, and nutritional deficiencies.²² Angular cheilitis is found in low numbers among children with poor nutritional status.²³ This may be due to the fact that at the time of the study, the nutritional health of the children was in a recovery phase.

In addition to angular cheilitis, inflammation of the lips, such as cheilitis, was also found in 7 children (3.50%). In this study, cheilitis was the fourth most commonly observed lesion after glossitis. This aligns with the research by Maula et al. (2022), which reported 8 cases of cheilitis, making it the third most common lesion found among respondents after glossitis.⁶ Furthermore, research by Wahyuni et al. (2021) reported a prevalence of cheilitis in children at 5.8%.²¹ There is no precise epidemiological data regarding the prevalence and incidence of cheilitis.²⁴ The primary etiology of cheilitis remains uncertain; however, predispositional factors such as micronutrient deficiencies, including vitamin B, iron, zinc, and vitamin C, play a role in the development of this lesion.⁶

Suspected oral candidiasis was found with a relatively high prevalence, being the second most frequently occurring lesion after oral ulcers, with a total of 19 children (9.50%). This lesion was most prevalent in the age group of 12–35 months (Table 3), and there

was no significant difference between male and female patients (Table 4). A study on children aged 0–5 years by Vieira et al. (2013) reported a prevalence of coated tongue at 23.8%.²⁰ In this study, all cases of candidiasis found occurred on the dorsum of the tongue. This finding is consistent with research by Hernawati (2019), which indicated that oral candidiasis is most commonly found on the dorsum of the tongue due to the tongue's surface frequently coming into direct contact with food and its uneven texture.²⁵

Geographic tongue was identified in 5 children, with a prevalence of 2.50%, predominantly occurring in males, with 4 children (80.00%) affected (Table 4). Geographic tongue was the fifth most common lesion encountered after cheilitis. The results of this study are similar to those of Maula (2019), who reported a prevalence of geographic tongue at 6.97% in malnourished toddlers.⁶ Research by Owczarek et al. (2022) showed 8 cases of geographic tongue with a prevalence of 5.6% in children in Poland.²⁶ This lesion is associated with emotional stress, nutritional deficiencies, allergies, genetic factors, immune deficiencies, and systemic diseases such as diabetes.

Soft tissue diseases categorized as "other lesions" occurred in 2 children (1.00%). These other lesions included gingival hyperpigmentation and hyperkeratosis on the buccal mucosa. Zinc deficiency can cause hyperpigmentation. In this study, hyperpigmentation was found in a 33-month-old boy. The lesions appeared in the attached gingiva area extending to the interdental papillae and were brown in color. Dave et al. (2020) reported that passive smoking children exhibit mild to severe melanin pigmentation.²⁷ Consistent with this study, the mother of the stunted child with gingival hyperpigmentation indicated that the child's father is an active smoker.

Hyperkeratosis was also identified in the "other lesions" category, occurring in a 34-month-old girl. This hyperkeratosis manifested on the buccal mucosa, appeared

white, and was a normal variation. This condition may result from mechanical trauma, such as the habit of cheek biting, which triggers excessive keratin formation due to continuous epithelial stimulation.²⁸ Stunted children tend to have unstable emotions, making them prone to anxiety or aggressive behavior due to disrupted social lives.²⁹ This may lead stunted children to develop bad habits, such as cheek biting (buccal mucosa).

One of the risk factors for stunting is the geographic location of an area.³⁰ The geographic position of Sukorambi District, located in the highlands at the foot of Mount Argopuro, can influence the economic status of its residents. This condition relates to the ability to provide optimal consumption variety, leading stunted children to often come from less affluent families.³⁰ Poverty increases the vulnerability of toddlers to infections. The geographical conditions of Sukorambi District, being far from the sea, make it difficult for residents to obtain folic acid, iron, and other types of nutrients typically sourced from fish. This situation contributes to various health issues in children, including oral health problems.

CONCLUSION

The study results show that the prevalence and distribution of soft tissue diseases in the oral cavity are 32.5%, with the highest cases occurring in females (50.98%) and in the age group of 24–35 months (27.14%). Oral ulcers have the highest prevalence at 10.50% (21 children), with the majority of cases in females (52.38%) and in the age group of 36–47 months (47.62%). The prevalence of other types of soft tissue diseases besides oral ulcers includes suspected oral candidiasis at 9.50% (19 children), glossitis at 4.00% (8 children), cheilitis at 3.50% (7 children), geographic tongue at 2.50% (4 children), angular cheilitis at 1.50% (3 children), and other lesions at 1.00% (2 children). Therefore, there is a need for special attention from health authorities, particularly regarding the oral health of stunted children,

as it can significantly impact their nutritional intake.

Declaration by Authors

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